



SMART at the New Carissa Oil Spill

The freighter New Carissa ran aground on the Oregon coast in a gale-force wind on February 4, 1999. Bad weather and logistics ruled out pumping the oil off the ship. After a week of battering by high waves, the engine room flooded and the ship began leaking oil. The Unified Command acted quickly to minimize the possibility that all 425,000 gallons of heavy fuel oil and diesel fuel aboard the vessel would spill into a pristine, protected environment. The Federal On-Scene Coordinator (FOSC) decided to burn the oil aboard the ship to prevent a catastrophic spill.

A burn of this magnitude may generate a great deal of black smoke, a possible concern for public health. The FOSC therefore requested particulate monitoring at nearby population centers. The Special Monitoring of Applied Response Technologies (SMART) was deployed for this purpose.

Monitoring methods

The U.S. Coast Guard, the National Oceanic and Atmospheric Administration (NOAA), the U.S. Environmental Protection Agency (EPA), and the Centers for Disease Control and Prevention developed SMART. Small, flexible teams equipped with rugged, easy-to-operate field instruments provide real-time data to the Unified Command during dispersant and in situ burning operations.

Coast Guard, EPA, and State of Oregon monitoring teams were called on scene as soon as it became apparent that a burn could take place. The Monitoring Group Supervisor coordinated the teams, a role shared by the Coast Guard and NOAA.

The teams used DataRam, Personal DataRam (PDR), and Nephelometer instruments. These instruments work on the principle of light scattering, with the readings converted to

weight of particulates in micrograms per cubic meter of air ($\mu\text{g}/\text{m}^3$). Instruments were calibrated and/or zeroed before field use.

The level of concern (LOC) adopted for this operation was $150 \mu\text{g}/\text{m}^3$ of particulates smaller than 10 micrometers in diameter (PM-10) averaged over a one-hour period. The Region 10 Regional Response Team, of which Oregon is a member, adopted this LOC value for in-situ burning operations.



Monitoring teams were instructed to report to the Group Supervisor at the command post when readings were above the level of concern and/or when three consecutive recorded readings were above background.

NOAA and the Coast Guard reviewed the reported data and briefed representatives of the Unified Command and local health officials. The digital and manually-recorded data were collected and archived by the Unified Command documentation unit. Monitoring operations were closely coordinated with the State of Oregon and local public health officials, who provided full support and assistance.

Monitoring results

February 11: Before the second burning attempt, the teams deployed at 1400 to the towns of Empire, North Bend, Hauser, and Umpqua, and at Horsfall Beach. Ignited around 1745, the fuel burned for about thirty hours.

Readings at Empire, North Bend, and Umpqua did not exceed 10-20 $\mu\text{g}/\text{m}^3$, the ambient particulate concentration (the area has good air quality and little pollution).

Around 1900, the wind, which initially blew from the south, changed direction and blew for about an hour from the south-southwest, carrying the smoke toward land. This increased the average particulate levels at Horsfall Beach to 40-50 $\mu\text{g}/\text{m}^3$. Although the team at Horsfall Beach smelled the smoke, they reported that it did not impede visibility. The elevated concentrations put the teams in a state of alert, but not alarm: the readings were about one-third of the level of concern, were recorded at an uninhabited area, and returned to background after an hour.

Elevated readings were also reported at Hauser, probably due to dust from a nearby road.

At 2200 it became apparent that the burn had stabilized and no significant plume impact had occurred. With the winds expected to remain southerly for the night, the monitoring efforts were scaled down to one stationary team in Empire, a roving team between North Bend and Hauser, and a Group Supervisor at the command post.

February 12: The burn aboard the New Carissa diminished gradually throughout the night. A monitoring team deployed to Horsfall Beach reported average particulate readings of 100 $\mu\text{g}/\text{m}^3$ at 1100, due to wind blowing the low plume onshore. This triggered the deployment of an additional, roving monitoring team between North Bend and Hauser. This team did not detect elevated particulate levels, because the smoke dissipated before reaching population centers.

As the burn diminished and later that evening nearly extinguished itself, monitoring was no longer needed.

February 13: At midnight the monitoring was placed on standby, and later terminated.

Lessons learned

Several lessons were derived from this monitoring operation, including:

- **SMART usability:** While similar monitoring had been done before, this was the first monitoring under the SMART program. Both the concept and the execution worked well.
- **Notification:** Early notification is key to timely monitoring. The first monitoring team arrived at 1400 on February 10, in time to deploy for the first burning attempt. Rapid notification for monitoring should be given in future burns.
- **Communication:** Communication was spotty at times. Radios did not always work due to distance and terrain. Cellular phones worked well, but not all teams had them. Cellular phones for all teams may provide the communication backup needed.
- **Cooperation with public health officials:** State and local public health officials were very interested in the monitoring results. Once informed of the monitoring plan, they cooperated closely and provided valuable assistance. Including them in the planning and providing them with timely results worked well.

Conclusions

SMART was deployed successfully for the New Carissa incident. No significant smoke impacts were detected by the monitoring teams at population centers near the burn. Good cooperation among team members and Federal, State, and local entities greatly contributed to the success of the monitoring operations.

For on-line information on SMART, visit our website at <http://response.restoration.noaa.gov/oilajds/SMART/SMART.html>.

